

CLAIMS

1. Abrasion-resistant yarns, fibres and filaments obtained from a composition comprising a polymer matrix,
5 the polymer matrix consisting of a polycondensate composed of:
 - 30 to 100 mol% (limits included) of macromolecular chains corresponding to the following formula (I):
$$R_3-(X-R_2-Y)_n-X-A-R_1-A-X-(Y-R_2-X)_m-R_3 \quad (I)$$
 - 10 - 0 to 70 mol% (limits included) of macromolecular chains corresponding to the following formula (II):
$$R_4-[Y-R_2-X]_p-R_3 \quad (II)$$
- in which:
 - X-Y- is a radical resulting from the condensation of two reactive functional groups F₁ and F₂ such that
 - F₁ is the precursor of the -X- radical and F₂ is the precursor of the -Y- radical, or vice versa,
 - the F₁ functional groups cannot react with one another by condensation,
 - 20 - the F₂ functional groups cannot react with one another by condensation,
 - A is a covalent bond or an aliphatic hydrocarbonaceous radical which can comprise heteroatoms and which comprises from 1 to 20 carbon atoms,
 - 25 - R₂ is a branched or unbranched, aliphatic or aromatic, hydrocarbonaceous radical comprising from 2 to 20 carbon atoms,
 - R₃ or R₄ represents hydrogen, a hydroxyl radical or a hydrocarbonaceous radical,
 - 30 - R₁ is a linear or cyclic, aromatic or aliphatic, hydrocarbonaceous radical which comprises at least 2 carbon atoms and which can comprise heteroatoms,
 - n, m and p each represent a number between 50 and 500.

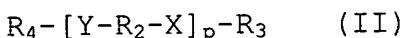
- 35 2. Yarns, fibres and filaments according to Claim 1, characterized in that the polymer matrix consists of a

polyamide A1 composed of:

- 30 to 100 mol% (limits included) of macromolecular chains corresponding to the following formula (I):



- 0 to 70 mol% (limits included) of macromolecular chains corresponding to the following formula (II):



10 in which:

- Y is the $\begin{array}{c} N \\ | \\ R_5 \end{array}$ radical when X represents the $\begin{array}{c} C \\ || \\ O \end{array}$

radical,

- Y is the $\begin{array}{c} C \\ || \\ O \end{array}$ radical when X represents the $\begin{array}{c} N \\ | \\ R_5 \end{array}$

radical,

15 - A is a covalent bond or an aliphatic hydrocarbonaceous radical which can comprise heteroatoms and which comprises from 1 to 20 carbon atoms,

- R_2 is a branched or unbranched, aliphatic or aromatic, hydrocarbonaceous radical comprising from 2 to 20 carbon

20 atoms,

- R_3 or R_4 represents hydrogen, a hydroxyl radical or a hydrocarbonaceous radical comprising a $\begin{array}{c} C \\ || \\ O \end{array}$

or $\begin{array}{c} N \\ | \\ R_5 \end{array}$ group,

- R_5 represents hydrogen or a hydrocarbonaceous radical comprising from 1 to 6 carbon atoms,

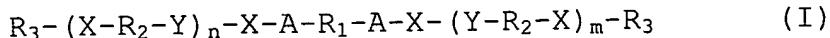
25 - R_1 is a linear or cyclic, aromatic or aliphatic, hydrocarbonaceous radical which comprises at least 2 carbon atoms and which can comprise heteroatoms,

- n, m and p each represent a number between 50 and 500.

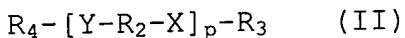
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3. Yarns, fibres and filaments according to Claim 1, characterized in that the polymer matrix consists of a polyester A2 composed of:

- 30 to 100 mol% (limits included) of macromolecular chains corresponding to the following formula (I):



5 - 0 to 70 mol% (limits included) of macromolecular chains corresponding to the following formula (II):



in which:

10 - Y is the $-O-$ radical when X represents the $\begin{array}{c} \text{C} \\ \parallel \\ \text{O} \end{array}$ radical,

- Y is the $\begin{array}{c} \text{C} \\ \parallel \\ \text{O} \end{array}$ radical when X represents the $-O-$ radical,

- A is a covalent bond or an aliphatic hydrocarbonaceous radical which can comprise heteroatoms and which comprises from 1 to 20 carbon atoms,

15 - R_2 is a branched or unbranched, aliphatic or aromatic, hydrocarbonaceous radical comprising from 2 to 20 carbon atoms,

- R_3 or R_4 represents hydrogen, a hydroxyl radical or a hydrocarbonaceous radical comprising a $\begin{array}{c} \text{C} \\ \parallel \\ \text{O} \end{array}$ or $-O-$

20 group,

- R_1 is a linear or cyclic, aromatic or aliphatic, hydrocarbonaceous radical which comprises at least 2 carbon atoms and which can comprise heteroatoms,

- n, m and p each represent a number between 50 and 500.

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4 Yarns, fibres and filaments according to one of the preceding claims, characterized in that n, m and p are between 100 and 300.

30 5. Yarns, fibres and filaments according to one of Claims 2 to 4, characterized in that the polyamide A1 or the polyester A2 comprises at least 45 mol%, preferably at least 60 mol%, of macromolecular chains corresponding to the formula (I).

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6. Yarns, fibres and filaments according to one of Claims 2 to 5, characterized in that the polyamide A1 or the polyester A2 exhibits a number-average molecular mass at least equal to 25 000 g/mol.

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7. Yarns, fibres and filaments according to one of the preceding claims, characterized in that R₂ is a pentamethylene radical.

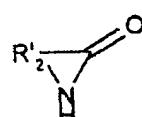
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8. Yarns, fibres and filaments according to one of Claims 2 to 7, characterized in that the polyamide A1 or the polyester A2 is obtained by copolymerization from a mixture of monomers comprising:

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- a) a difunctional compound, the reactive functional groups of which are chosen from amines, carboxylic acids, alcohols, and their derivatives, the reactive functional groups being identical,
- b) monomers of following general formulae (IIIa) and (IIIb), in the case of the polyamide A1

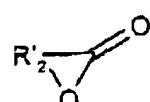
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X'-R'₂-Y' (IIIa) or (IIIb)

b') monomers of following general formulae (IIIa') and (IIIb'), in the case of the polyester A2

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X'-R'₂-Y' (IIIa) or (IIIb)

in which:

- R'₂ represents a substituted or unsubstituted, aliphatic, cycloaliphatic or aromatic, hydrocarbonaceous radical which comprises from 2 to 20 carbon atoms and which can comprise heteroatoms,

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- Y' is an amine radical when X' represents a carboxyl radical, or Y' is a carboxyl radical when X' represents an amine radical, in the case of the polyamide A1,
- 5 • Y' is a hydroxyl radical when X' represents a carboxyl radical, or Y' is a carboxyl radical when X' represents a hydroxyl radical, in the case of the polyester A2.

10 9. Yarns, fibres and filaments according to Claim 8, characterized in that the compound a) represents between 0.05 and 1 mol% with respect to the number of moles of monomers of type b) or b').

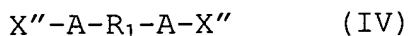
15 10. Yarns, fibres and filaments according to one of Claims 2 to 7, characterized in that the polyamide A1 or the polyester A2 is obtained by melt blending a polyamide of the type of those obtained by polymerization of lactams and/or amino acids or a polyester of the type of 20 those obtained by polymerization of lactones and/or hydroxy acids with a difunctional compound, the reactive functional groups of which are chosen from amines, alcohols, carboxylic acids and their derivatives, the reactive functional groups being identical.

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11. Yarns, fibres and filaments according to Claim 10, characterized in that the difunctional compound represents between 0.05 and 2% by weight with respect to the weight of polyamide or of polyester.

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12. Yarns, fibres and filaments according to one of Claims 8 to 11, characterized in that the difunctional compound is represented by the formula (IV):



35 in which X'' represents an amine radical, a hydroxyl radical, a carboxyl group or their derivatives.

13. Yarns, fibres and filaments according to one of Claims 8 to 12, characterized in that the

5 difunctional compound is chosen from adipic acid, decanedioic acid, sebacic acid, dodecanedioic acid, terephthalic acid, isophthalic acid, hexamethylene-diamine, methylpentamethylenediamine, 4,4'-diamino-dicyclohexylmethane, butanediamine, metaxylylenediamine,
10 1,3-propanediol, 1,2-ethanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol and polytetrahydrofuran.

14. Yarns, fibres and filaments according to one of Claims 2 to 7, characterized in that the polyamide A1 or
15 the polyester A2 is obtained by melt blending a polyamide of the type of those obtained by polymerization of lactams and/or amino acids or a polyester of the type of those obtained by polymerization of lactones and/or hydroxy acids with a compound of formula (V)

20 G-R-G (V)

in which

- R is substituted or unsubstituted, linear or cyclic, aromatic or aliphatic, hydrocarbonaceous radical which can comprise heteroatoms,
- 25 • G is a functional group or a radical which can selectively react either with the amine reactive functional groups or with alcohol reactive functional groups or with the carboxylic acid reactive functional groups of the polyamide or of the polyester, to form covalent bonds.

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15. Yarns, fibres and filaments according to Claim 14, characterized in that the compound of formula (V) represents between 0.05 and 2% by weight with respect
35 to the weight of polyamide or of polyester.

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16. Article comprising yarns, fibres and/or filaments according to one of Claims 1 to 15.

17. Article according to Claim 16, characterized in
5 that it is a felt for a paper-making machine.

18. Article according to Claim 16, characterized in
that it is a carpet, including a fitted carpet.

19. Article according to Claim 16, characterized in
10 that it is a rope or a belt.

20. Article according to Claim 16, characterized in
that it is a fabric for print transfer or for filtration.

15 21. Article according to Claim 16, characterized in
that it is a net.